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Comparison of open- and closed-porous foamed glass

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Foamed glass is a lightweight material mainly used for thermal insulation in the construction and chemical industry. Its excellent combination of properties is related to closed pores filled with CO₂ gas and low density (i.e. high porosity). In order to obtain superior insulation properties several parameters need to be tuned in relation to the composition of the glass used for the synthesis. For acoustic insulation, however, open porosity is preferred. Despite straightforward application in acoustics the reports on this aspect are scarce. In this contribution, we present the results of our work focused on development of closed and open porous foamed glass for thermal and acoustic insulation. Open and closed-porous foamed glasses were prepared from cullets of different chemical composition. For closed-porous samples CRT-panel glass was used, while for open-porous samples bottle glass was used. The closed and open porosity of both samples was further tuned by specific additives for adjusting surface tension or crystallization. Thus we were able to prepare samples with 95 % closed or open porosity at a density of 100–120 kg/m³. The synthesis, and thermal and acoustic properties will be discussed.